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## The Rise of Artificial Intelligence in the Legal Field: Where We Are and Where We Are Going

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# THE RISE OF ARTIFICIAL INTELLIGENCE IN THE LEGAL FIELD: WHERE WE ARE AND WHERE WE ARE GOING

SERGIO DAVID BECERRA\*

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## ABSTRACT

*The twenty-first century has brought significant technological advancement that permeates all aspects of our lives. The legal field, though slow in the adaptation of this technology, is beginning to pick up the pace. Artificial Intelligence (AI) technology is used now to perform legal work once completed solely by legal practitioners. This Comment outlines what AI is and reviews the current use of AI in the legal field. It also identifies AI products and developments that are in place. Finally, it argues that lawyers will always be needed in the practice of law, despite the continued growth of AI.*

## I. INTRODUCTION

The year 2000 was met with extreme uncertainty and fear because of alleged software and hardware problems.<sup>1</sup> Yet the rapid ongoing pace of technological advancement since then is now a basic and welcomed aspect of our daily lives. Today, we see the ease of communicating with others across the globe, the development of self-driving cars,<sup>2</sup> increased efficiency in purchasing consumer goods, various entertainment options, and the growth of the Internet;<sup>3</sup> all of which were uncommon at the turn of the century.

Alongside these technological changes, the past ten years have also seen the effects of the “Great Recession” in economies and markets throughout the world.<sup>4</sup> This economic upheaval started with the subprime mortgage crisis in the United States in 2006 and 2007, and led to the worldwide financial crisis in 2008 and beyond.<sup>5</sup> The Great Recession has touched virtually every American—resulting in high reductions in pay, shattered budgets, loss of savings accounts, changed spending and borrowing habits, and long-term unemployment plunging to historic levels.<sup>6</sup> This had also taken a toll on U.S. businesses, with corporations suddenly finding they were struggling to survive;<sup>7</sup> forcing them to continually assess their approaches to the “new normal” in an attempt to regain prerecession growth rates for sales and profits.<sup>8</sup>

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<sup>1</sup> Known as the Y2K bug, computer programmers feared that as the year 2000 approached, computers might not interpret the two-digit code 00 as 2000, but as 1900. This resulted in fears that activities that were programmed on a daily or yearly basis (i.e. interest rates, routine safety maintenance, scheduled flights) could be damaged or flawed. *Y2K Bug*, NAT’L GEOGRAPHIC, <http://www.nationalgeographic.org/encyclopedia/Y2K-bug/> (last updated Jan. 21, 2011).

<sup>2</sup> California Department of Motor Vehicles developed an Autonomous Vehicle Tester Program. *Testing of Autonomous Vehicles*, STATE OF CAL. DEP’T OF MOTOR VEHICLES, <https://www.dmv.ca.gov/portal/dmv/detail/vr/autonomous/testing> (last visited Nov. 7, 2017).

<sup>3</sup> Sensors and actuators embedded in physical objects—from roadways to pacemakers—are linked through wired and wireless networks, often using the same Internet Protocol (IP) that connects the Internet. These networks churn out huge volumes of data that flow to computers for analysis. When objects can both sense the environment and communicate, they become tools for understanding complexity and responding to it swiftly.

Michael Chui et al., *The Internet of Things*, MCKINSEY & COMPANY (Mar. 2010), <http://www.mvkinsmckinsey.com/industries/high-tech/our-insights/the-internet-of-things>.

<sup>4</sup> *2017 Report on the State of the Legal Market*, THOMSON REUTERS, <http://legalsolutions.thomsonreuters.com/law-products/solutions/peer-monitor/complimentary-reports> (last visited Nov. 7, 2017).

<sup>5</sup> *Id.*

<sup>6</sup> *The Great Recession*, PEW RESEARCH CTR., <http://www.pewsocialtrends.org/series/the-great-recession/> (last visited Nov. 7, 2017).

<sup>7</sup> Rakesh Duggal & Michael C. Budden, *The Effects Of The Great Recession On Corporate Working Capital Management Practices*, INT’L BUS. & ECON. RES. J. (July 2012), <https://www.cluteinstitute.com/ojs/index.php/IBER/article/view/7062/7136>.

<sup>8</sup> Ranjay Gulati et al., *Roaring Out of Recession*, HARV. BUS. REV. (Mar. 2010), <https://hbr.org/2010/03/roaring-out-of-recession>.

The effect of the Great Recession on the legal industry has been particularly striking.<sup>9</sup> What was once a seller's market has now shifted to a buyer's market,<sup>10</sup> resulting in fundamental changes to the legal industry.<sup>11</sup> In short, "the past decade has been a period of stagnation in demand growth for law firm services, decline in productivity for most categories of lawyers, growing pressure on rates as reflected in declining realization, and declining profit margins."<sup>12</sup>

Additionally, law schools have experienced the effects of the recession. In January 2017, the Department of Education released their first gainful employment report—which measures graduates' debt-to-earnings ratios—in which three law schools were notified that they were in danger of failing, with two other law schools outright failing.<sup>13</sup> If these two schools fail again in 2018, they will lose access to the federal student loan program.<sup>14</sup> Another school recently closed its doors at the end of June 2017.<sup>15</sup> Although for most law school graduates the benefits of a law degree exceed its cost by a large margin,<sup>16</sup> lawyers entering the legal field are facing significant competition in a market attempting to reinvent itself.<sup>17</sup>

These vast effects of the recession stand in stark contrast to the modest influences of the high-paced technological advancements in the legal field and legal education.<sup>18</sup> As a result, the legal profession continues to have notable impediments in this society of new technology:<sup>19</sup> the profession has a legacy of humans,<sup>20</sup> an antiquated way of doing things, pushback from partners regarding change, a backlog of work, and is generally slower in its adaptation to technology.<sup>21</sup> The consequences from the combination of these impediments is corporate

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<sup>9</sup> 2017 Report on the State of the Legal Market, *supra* note 4, at 2.

<sup>10</sup> *Id.*

<sup>11</sup> *Id.*

<sup>12</sup> *Id.* The report attributes these declines to the death of traditional billable hour pricing, erosion of the traditional law firm franchise, declining effectiveness of the traditional leverage model, and growing segmentation within the market for law firm services. *Id.*

<sup>13</sup> Stacy Zaretsky, 2 Law Schools Fail Government's Gainful Employment Test, 3 More On Chopping Block, ABOVE THE LAW (Jan. 12, 2017), <http://abovethelaw.com/2017/01/2-law-schools-fail-governments-gainful-employment-test-3-more-on-chopping-block/>.

<sup>14</sup> *Id.*

<sup>15</sup> Debra Cassens Weiss, *Indiana Tech Law School will close after \$20M loss*, ABA JOURNAL (Oct. 31, 2016), [http://www.abajournal.com/news/article/indiana\\_tech\\_law\\_school\\_will\\_close\\_after\\_20m\\_loss](http://www.abajournal.com/news/article/indiana_tech_law_school_will_close_after_20m_loss).

<sup>16</sup> Michael Simkovic & Frank McIntyre, *The Economic Value of a Law Degree*, 43 J. LEGAL STUD. 249 (June 2014).

<sup>17</sup> 2017 Report on the State of the Legal Market, *supra* note 4.

<sup>18</sup> See Nancy B. Talley, *Imagining the Use of Intelligent Agents and Artificial Intelligence in Academic Law Libraries*, 108 L. LIBR. J. 383 (2016).

<sup>19</sup> Stanfordlawschool, *FutureLaw 2016: Hot or Not—Watson and Beyond*, YOUTUBE (May 31, 2016), <https://www.youtube.com/watch?v=AJp-pQS5a1Q>.

<sup>20</sup> *Id.*

<sup>21</sup> Lara Bullock, *Legal Profession 'Slower to Adapt' to Technology*, LAWYERS WEEKLY (Sept. 4, 2015), <http://www.lawyersweekly.com.au/news/17092-legal-profession-slower-to-adapt>.

counsel pushback,<sup>22</sup> lack of justice for the lower and middle classes,<sup>23</sup> a notion that the legal field is more interested in protecting existing value rather than creating value,<sup>24</sup> and overall skepticism.

Despite this somber news, the legal field has been playing catch-up these last few years.<sup>25</sup> “Faced with cost pressures, clients and law firms are leveraging legal information technology to either automate or semi-automate tasks previously performed by teams of lawyers.”<sup>26</sup> Areas of the practice of law that are increasingly utilizing technology include legal research, discovery, and contract analysis.<sup>27</sup> The advantages of technology have even been recognized in judicial opinions. In a discovery dispute, United States Magistrate Judge Andrew J. Peck stated that although he could not require a party to choose technology assisted review (TAR) over keyword searching, “in general, TAR is cheaper, more efficient and superior to keyword searching.”<sup>28</sup>

New technological possibilities are presenting themselves at a drastically nonlinear rate.<sup>29</sup> Artificial Intelligence (AI) is one aspect of this technological boom that will continue to play an increasing role in the way lawyers engage with their work, interact with clients, and compete in the marketplace.<sup>30</sup> Nevertheless, there is still a general lack of consensus of what AI is, what role it presently plays in the legal field, and where it is being taken to advance the practice of law.<sup>31</sup>

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<sup>22</sup> *Getting Paid—Is Time Running Out on the Hourly Rate?*, 73-JUN BENCH & B. MINN. 30 (May/June 2016) (showing the growth of general counsel and outsourcing of various legal work to non-legal firms and/or contract attorneys).

<sup>23</sup> Alix Ware, *Can Technology Help the Middle Class Close the Justice Gap?*, JURIST (Dec. 11, 2015, 6:58 PM), <http://www.jurist.org/hotline/2015/12/naree-chan-justice-gap.php>.

<sup>24</sup> *2017 Report on the State of the Legal Market*, *supra* note 4.

<sup>25</sup> Michael Mills, *Using AI in Law Practice: It's Practical Now*, 42 NO. 4 L. PRAC. 48 (2016).

<sup>26</sup> Daniel Martin Katz, *Quantitative Legal Prediction—Or—How I Learned to Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry*, 62 EMORY L.J. 909, 910 (2013).

<sup>27</sup> Mills, *supra* note 25.

<sup>28</sup> *Hyles v. New York City*, 2016 U.S. Dist. LEXIS 100390, at 5 (S.D.N.Y. Aug. 1, 2016).

To be clear, the Court believes that for most cases today, TAR is the best and most efficient search tool. That is particularly so, according to research studies (cited in *Rio Tinto*), where the TAR methodology uses continuous active learning (“CAL”), which eliminates issues about the seed set and stabilizing the TAR tool. The Court would have liked the City to use TAR in this case. But the Court cannot, and will not, force the City to do so. There may come a time when TAR is so widely used that it might be unreasonable for a party to decline to use TAR. We are not there yet.

*Id.* at 9–10.

<sup>29</sup> Frank Pasquale & Glyn Cashwell, *Four Futures of Legal Automation*, 63 UCLA L. REV. DISC. 26 (2015).

<sup>30</sup> Julie Sobowale, *How Artificial Intelligence Is Transforming the Legal Profession*, ABA JOURNAL (Apr. 1, 2016, 12:10 AM), [http://www.abajournal.com/magazine/article/how\\_artificial\\_intelligence\\_is\\_transforming\\_the\\_legal\\_profession](http://www.abajournal.com/magazine/article/how_artificial_intelligence_is_transforming_the_legal_profession).

<sup>31</sup> Joshua Mirwis, *Artificial Intelligence and the Legal Profession*, LAW

This Comment provides an understanding of what AI is, an overview of the current use of AI in the legal field, developments attempting to expand the beneficial use of AI, and its implications in the legal field. Accordingly, Part II will begin with the fundamentals of AI, provide its history in the legal field, introduce technology associated with AI, and end with a definition of AI as applied to the practice of law.<sup>32</sup> Part III will use this definition in evaluating various uses currently in the market.<sup>33</sup> Part IV will introduce potential implications for the practice of law,<sup>34</sup> and Part V concludes.<sup>35</sup> Overall, this Comment seeks to educate and explain where AI currently is in the legal market, recognizing that this will continue to evolve with the passing of time.

## II. WHAT IS ARTIFICIAL INTELLIGENCE

### A. Overview of Artificial Intelligence

Much has been said recently about the rise of artificial intelligence and its potential to replace a high percentage of the current workforce.<sup>36</sup> Adding to this perceived notion of jobs ceasing to exist is the alleged scenario in which “artificial intelligence could spell the end of the human race.”<sup>37</sup> The legal field has also seen similar and dramatic predictions, with assertions that “[a]cademically trained attorneys are increasingly being replaced by technology,”<sup>38</sup> that AI is de-

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CAREERS.NET (June 21, 2016) <https://www.lawcareers.net/Information/CommercialQuestion/Olswang-LLP-Artificial-Intelligence-and-the-legal-profession>.

<sup>32</sup> See *infra* Part II.

<sup>33</sup> See *infra* Part III.

<sup>34</sup> See *infra* Part IV.

<sup>35</sup> See *infra* Part V.

<sup>36</sup> Chris Weller, *Elon Musk Doubles Down on Universal Basic Income: ‘It’s Going to Be Necessary’*, BUSINESS INSIDER (Feb. 13, 2017, 12:53 PM), [http://www.businessinsider.com/elon-musk-universal-basic-income-2017-2?utm\\_content=buffer989d0&utm\\_medium=social&utm\\_source=facebook.com&utm\\_campaign=buffer-ti](http://www.businessinsider.com/elon-musk-universal-basic-income-2017-2?utm_content=buffer989d0&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer-ti). Elon Musk, in an interview in November 2016, stated that he believes the effect will be so dramatic that the world will require universal basic income. *Id.* Along with this, the article also cites United States President Barack Obama warning Congress in March of 2016 about the emerging threat of high job loss, “based on several reports that found that as much as 50% of jobs could be replaced by robots by 2030.” *Id.*

<sup>37</sup> Kevin J. Ryan, *Stephen Hawking Sets Out to Control Artificial Intelligence—Before It Controls Us*, INC. (Oct. 21, 2016), [http://www.inc.com/kevin-j-ryan/stephen-hawking-artificial-intelligence-research-center.html?cid=sf01002&sr\\_](http://www.inc.com/kevin-j-ryan/stephen-hawking-artificial-intelligence-research-center.html?cid=sf01002&sr_). See also Matthew Sparkes, *Top Scientists Call for Caution Over Artificial Intelligence*, THE TELEGRAPH (Jan. 13, 2015, 11:46 AM), <http://www.telegraph.co.uk/technology/news/11342200/Top-scientists-call-for-caution-over-artificial-intelligence.html> (suggesting “that it ‘may be desirable to retain some form of meaningful human control’ over intelligent machines designed to kill.”).

<sup>38</sup> Ephrat Livni, *Your next lawyer could be a machine*, WORLD ECON. FORUM (Feb. 6, 2017), [https://www.weforum.org/agenda/2017/02/machines-could-soon-replace-lawyers?utm\\_content=buffer4bd99&utm\\_medium=social&utm\\_source=facebook.com&utm\\_campaign=buffer](https://www.weforum.org/agenda/2017/02/machines-could-soon-replace-lawyers?utm_content=buffer4bd99&utm_medium=social&utm_source=facebook.com&utm_campaign=buffer). The author here goes so far as to state that law graduates will be lucky to have any work in the upcoming years. See

veloping the ability to put forth arguments in a logical way,<sup>39</sup> and that the theory of disruptive innovation will show Big Law being upended by new, technological startups.<sup>40</sup>

Yet, within these various assertions regarding the legal community, little is said about what AI specifically is.<sup>41</sup> Many speak of the roles and implications of AI without defining it or briefly giving differing and simplified views of what it is.<sup>42</sup> While it will be considered presumptuous by some to attempt to resolve the dispute of how AI in the practice of law is defined,<sup>43</sup> this Comment, and future discussions, require a working definition and established scope.

AI has an impressive underpinning comprised of computer science, mathematics, philosophy, psychology, economics, neuroscience, linguistics, and biology.<sup>44</sup> Preceding a definition, a satisfying way to view current AI generally is as

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also Joe Palazuolo, *Why Hire a Lawyer? Computers are Cheaper*, THE WALL STREET J. (Jun. 18, 2012, 2:06 PM), <https://www.wsj.com/articles/SB10001424052702303379204577472633591769336?cb=logged0.17135589593090117>.

<sup>39</sup> Susan Beck, *The Future of Law*, THE AM. LAWYER (Aug. 2014), [https://www.akerman.com/documents/AmLaw\\_Innovation\\_29504636\\_v\\_1.PDF](https://www.akerman.com/documents/AmLaw_Innovation_29504636_v_1.PDF).

Weber, a former litigation partner at Jones Day, says Watson won't replace the judgment of a senior law firm partner, but it could eventually handle tasks of senior associates. He sees it researching and writing a memo summarizing the law and suggesting the most persuasive arguments and precedents. Or it might quickly review stacks of contracts, looking for differences in indemnification clauses.

*Id.*

<sup>40</sup> *Id.* See also Shannon Spangler, *Disruptive Innovation in the Legal Services Market: Is real change coming to the business of law, or will the status quo reign?* ABA ANNUAL MEETING (Aug. 2014), [http://www.americanbar.org/content/dam/aba/administrative/litigation/materials/2014\\_aba\\_annual/written-materials/disruptive\\_innovation.authcheckdam.pdf](http://www.americanbar.org/content/dam/aba/administrative/litigation/materials/2014_aba_annual/written-materials/disruptive_innovation.authcheckdam.pdf). There, significant attention is given to Harvard business professor Clayton Christensen's theory of disruptive innovation.

<sup>41</sup> See Matthew U. Scherer, *Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, And Strategies*, 29 HARV. J.L. & TECH. 353 (2016).

<sup>42</sup> Compare Daniel Martin Katz, *Quantitative Legal Prediction—Or—How I Learned to Stop Worrying and Start Preparing for the Data-Driven Future of the Legal Services Industry*, 62 EMORY L.J. 909 (2013) (where AI is categorized as either hard or soft AI; with soft AI being defined as quantitative legal prediction), John O. McGinnis & Russell G. Pearce, *Colloquium: The Legal Profession's Monopoly on the Practice of Law: The Great Disruption: How Machine Intelligence Will Transform the Role of Lawyers in the Delivery of Legal Services*, 82 FORDHAM L. REV. 3041 (May, 2014) (where AI is passively defined as machine intelligence), Frank Pasquale & Glyn Cashwell, *Four Futures of Legal Automation*, 63 UCLA L. REV. DISC. 26 (2015) (defining AI as any sort of legal automation), and Scherer, *supra* note 41 (defining AI, strictly for the purposes of his paper, as referring to machines that are capable of performing tasks that, if performed by a human, would be said to require intelligence).

<sup>43</sup> Scherer, *supra* note 41.

<sup>44</sup> Mark Maloof, *Artificial Intelligence: An Introduction*, GEORGETOWN U. (Jan. 7, 2015), <http://people.cs.georgetown.edu/~maloof/cosc270.s15/cosc270-intro-handout.pdf>.

Computer Science: machines, languages, formal theories of computation; Mathematics: limits of computation, probability, statistics, Bayes' rule, experimental design; Philosophy: logic, epistemology, philosophy of mind, theories of consciousness; Psychology: cognitive models, human problem solving and learning, etc.; Economics: decision theory, game theory; Neuroscience: per-

a “big forest of academic and commercial work around ‘the science and engineering of making intelligent machines.’”<sup>45</sup> This view combines the definition given by John McCarthy,<sup>46</sup> the individual who coined the term artificial intelligence, with the expertise of Michael Mills.<sup>47</sup> Mills, in his 2016 white paper, gives a snapshot of this forest with the following diagram:<sup>48</sup>

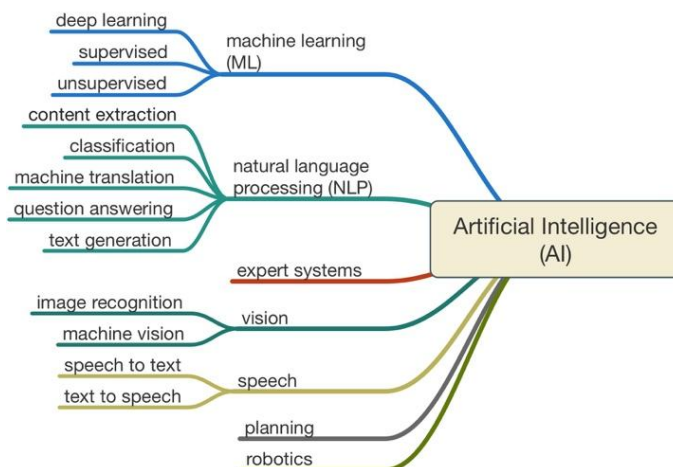


Figure 1<sup>49</sup>

As shown in Figure 1, AI covers a variety of processes including those, such as image recognition or robotics, that currently have no implementation in the practice of law.<sup>50</sup> Differing somewhat in their approach, AI experts Russell

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ception, neural models; Linguistics: human language, translation, grammars;  
Biology: adaptive systems, evolving systems.

*Id.*

<sup>45</sup> Michael Mills, *Artificial Intelligence in Law: The State of Play 2016*, THOMSON REUTERS LEGAL EXECUTIVE INSTITUTE (Mar. 24, 2016), <http://legalexecutiveinstitute.com/artificial-intelligence-law-state-play-2016/>.

<sup>46</sup> McCarthy stated that AI was “the science and engineering of making intelligent machines.” *Id.*

<sup>47</sup> Michael Mills is Co-Founder & Chief Strategy Officer of Neota Logic, a provider of intelligent software currently researching how AI can allow lawyers to build better tools for legal services while also providing software for firms with the goal of leveraging without associates and billing without hours. *Law Firm Leaders Shark Tank: Michael Mills of Neota Logic talks AI*, THOMSON REUTERS LEGAL EXECUTIVE INSTITUTE (Dec. 5, 2016), <http://legalexecutiveinstitute.com/sharktank-neota-logic/>.

<sup>48</sup> Mills, *supra* note 45.

<sup>49</sup> *Id.*

<sup>50</sup> *See id.*



and Norvig provide the following four concepts with which to view AI: 1) systems that think like humans, 2) systems that act like humans, 3) systems that think rationally, and 4) systems that act rationally.<sup>51</sup>

### *B. History of Artificial Intelligence in the Law*<sup>52</sup>

A 1970 article by Bruce G. Buchanan and Thomas E. Headrick was one of the earliest discussions of AI in the law. They wrote that AI would have to mirror a person's reasoning process in order to accomplish the desired solution.<sup>53</sup> More specifically, they proposed that AI would have to mimic the analytical reasoning of lawyers to arrive at a legal solution.<sup>54</sup> This notion goes to the legal research and writing skills taught in IL courses throughout law schools, stating that these skills would have to be incorporated into a computer program that could successfully utilize them to come to not only a correct solution, but the best solution.<sup>55</sup>

In 1990, another seminal article on this was written, which defined AI as "the study of cognitive processes using the conceptual frameworks and tools of computer science."<sup>56</sup> This definition also required of AI an understanding and modeling of legal reasoning.<sup>57</sup> The paper reviewed then-current projects in AI with relation to practicing law.<sup>58</sup> A unifying theme of the projects was the goal to understand and model legal argument.<sup>59</sup> This goal required that we first know how to represent several types of knowledge, such as cases, rules, and arguments; second, how to reason with them, such as manipulating precedents, applying and making inferences with rules, and tailoring arguments to facts; and third, how to use them ultimately in a computer program that could perform tasks in legal reasoning and argumentation.<sup>60</sup> Finally, several aims were listed for an ideal AI and law program to achieve, such as combining several modes of

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<sup>51</sup> STUART RUSSELL & PETER NORVIG, *ARTIFICIAL INTELLIGENCE - A MODERN APPROACH*, (3d ed. 2010), <https://www.google.com/url?sa=t&rct=j&q=&esrc=s&source=web&cd=2&ved=0ahUKEwjnyvbJ8JLSAhWrijVQKHUXbDXMQFgghMAE&url=https%3A%2F%2Ffaculty.psau.edu.sa%2Ffiledownload%2Fdoc-7-pdf-a154ffbceec538a4161a406abf62f5b76-original.pdf&usg=AFQjCNE-JSNyAaRi9e4MzACPQwYgfYA&sig2=yhJtMMY4RH4bhGDak86-dg>.

<sup>52</sup> For a more detailed while still brief introduction, see Edwin L. Rissland et al., *AI and Law: A fruitful synergy*, INT'L ASS'N FOR ARTIFICIAL INTELLIGENCE AND LAW (last visited Feb. 17, 2017), <http://www.iaail.org/?q=page/ai-law>.

<sup>53</sup> Bruce G. Buchanan & Thomas E. Headrick, *Some Speculation About Artificial Intelligence and Legal Reasoning*, 23 STAN. L. REV. 40, 51 (Nov. 1970).

<sup>54</sup> *Id.*

<sup>55</sup> *Id.* at 55.

<sup>56</sup> Edwina L. Rissland, *Artificial Intelligence and Law: Stepping Stones to a Model of Legal Reasoning*, 99 YALE L.J. 1957, 1958 (June 1990).

<sup>57</sup> *Id.* at 1960.

<sup>58</sup> See generally *id.*

<sup>59</sup> *Id.*

<sup>60</sup> *Id.* at 1957.

reasoning, formulating arguments and explanations, and accommodating changes in the base of legal knowledge.<sup>61</sup>

The notion that a competent AI machine would have to mimic the reasoning practiced by a lawyer creates many questions aimed at having to determine how a lawyer thinks, researches, reasons, and argues. These are questions that have differing answers and result in ongoing discourse. Yet, even if there were definitive answers, it does not necessarily follow that AI would have to proceed along the same analytical path.

This Comment posits that a definition of the utilization of AI in the practice of law does not require a simulation of a lawyer's cognitive processes to arrive at a legal conclusion. While many of the definitions and approaches have been aimed at a human aspect—thinking, acting, being rational, perception—AI does not have to necessarily do the same legal reasoning performed by a human; it just has to arrive at the same conclusion as a legal practitioner.

Support for this is found in the formulation of the term “soft AI,” defined as “attempts to mimic human intelligence in outcomes, but not in its underlying processes.”<sup>62</sup> With soft AI comes the awareness that “we still have only a very limited understanding of the human brain, and thus the direct artificial intelligence attempts to model its internal processes have borne little fruit.”<sup>63</sup> Indeed, any law firm that incorporates AI into their practice would not demand that the software be familiar with the IRAC<sup>64</sup> method, understand the public policy behind criminal law, or be able to pass a state bar examination. They would utilize it because of the results it would produce and not because of the knowledge it came equipped with.

With this assertion comes the acknowledgement that any team of computer scientists who engage in the creation of AI for legal use will be required to either understand legal analysis or collaborate with those that do. The skill level required for this is high. If the legal professionals who assist in this work do not excel in the law, the risk of recurring error will be greater.<sup>65</sup> Thus, AI development will require the input of those who are good as technical lawyers.<sup>66</sup> It follows then that behind-the-scenes research and development of AI for legal use will continue to be a multi-disciplinary activity between engineers, users, big data experts, legal data experts, and lawyers.

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<sup>61</sup> *Id.*

<sup>62</sup> Katz, *supra* note 26, at 918.

<sup>63</sup> *Id.*

<sup>64</sup> IRAC is an acronym used in law schools to guide the student in analysis of a case and/or in writing a legal argument. *The IRAC Formula*, LAWNERDS.COM, <http://www.lawnerds.com/guide/-irac.html> (last visited Jan. 31, 2018). It stands for: Issue, Rule, Analysis (or Application), and Conclusion. *Id.*

<sup>65</sup> Stanfordlawschool, *supra* note 19.

<sup>66</sup> *Id.*

### C. The Technology of Artificial Intelligence

An understanding of AI requires knowledge of certain technology.<sup>67</sup> On its own, this technology has no direct relation to the practice of law. A brief introduction, however, is beneficial. The following technology is discussed: big data, algorithms, natural language processing, machine learning, and automation.

A 2014 article by UC Berkeley's School of Information provided over forty definitions of big data.<sup>68</sup> At the time that article was written, a common definition of big data cited the three Vs: volume, velocity, and variety.<sup>69</sup> A 2016 Oracle white paper has now added a fourth V to the list: value.<sup>70</sup> Yet big data can be sufficiently defined as "extremely large data sets that may be analyzed computationally to reveal patterns, trends, and associations, especially relating to human behavior and interactions."<sup>71</sup> The value of big data is gained when a method is put in place that strategically manages and synthesizes this data to provide a specifically desired understanding of the big picture.<sup>72</sup>

An algorithm is any routine process, or set of steps, for solving a program or performing a task.<sup>73</sup> The same is true for algorithms as they relate to computer science,<sup>74</sup> with success lying in finding good algorithms and knowing when to apply them.<sup>75</sup> Recently, new algorithms have been developed that improve the performance of machine learning.<sup>76</sup> These algorithms have become more easily

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<sup>67</sup> Alex Castrounis, *Artificial Intelligence, Deep Learning, and Neural Networks Explained*, INNOARCHITECH (Sept. 1, 2016), <https://www.innoarchitech.com/artificial-intelligence-deep-learning-neural-networks-explained/>.

<sup>68</sup> Jennifer Dutcher, *What is Big Data?*, BERKELEY SCH. OF INFO.: DATASCIENCE@BERKELEY (Sept. 03, 2014), <https://datascience.berkeley.edu/what-is-big-data/#List>.

<sup>69</sup> *Id.* See also *IT Glossary*, GARTNER, <http://www.gartner.com/it-glossary/big-data/> (defining big data as "high-volume, high-velocity and/or high-variety information assets that demand cost-effective, innovative forms of information processing that enable enhanced insight, decision making, and process automation.").

<sup>70</sup> *An Enterprise Architect's Guide to Big Data*, ORACLE, (Mar. 2016), <http://www.oracle.com/tech/network/topics/entarch/articles/oea-big-data-guide-1522052.pdf>. Volume-refers to not just the amount of data, but also the nature of data, such as low-density data vs. high-density data. *Id.* An example of low-density data is twitter data feeds, or clicks on a web page. *Id.* Big data has the task of converting this low-density data into high-density data, which is data that has value. Velocity-the speed of the rate at which data is received and perhaps acted upon. *Id.* Variety-this can result from new unstructured data types. Examples of this are text, audio, or video data, which require additional processing. *Id.* Once processed for meaning it is then structured for summarization, lineage, auditability, and privacy. *Id.* Value-the intrinsic value of data, which requires it first be discovered. *Id.*

<sup>71</sup> Define Big Data, GOOGLE, [https://www.google.com/#q=define+big+data&\\*>](https://www.google.com/#q=define+big+data&*>).

<sup>72</sup> *An Enterprise Architect's Guide to Big Data*, ORACLE, (Mar. 2016), <http://www.oracle.com/tech/network/topics/entarch/articles/oea-big-data-guide-1522052.pdf>.

<sup>73</sup> David Schatsky, et al., *Demystifying Artificial Intelligence*, DELOITTE U. PRESS (Nov. 04, 2014), <https://dupress.deloitte.com/dup-us-en/focus/cognitive-technologies/what-is-cognitive-technology.html#endnote-sup-11>.

<sup>74</sup> *What is an algorithm and why should you care?*, KHANACADEMY, <https://www.khanacademy.org/computing/computer-science/algorithms/intro-to-algorithms/v/what-are-algorithms>.

<sup>75</sup> *Id.*

<sup>76</sup> Schatsky, *supra* note 73.

accessible on an open-source basis, which is likely to foster further improvements as developers contribute enhancements to each other's work.<sup>77</sup>

Natural language processing (NLP) is a software program's ability to understand human speech as it is spoken.<sup>78</sup> The challenge with this is the computer's inability to easily understand human speech.<sup>79</sup> Communicating with a computer through programming language is significantly more reliable because programming language is precise, unambiguous, and highly structured.<sup>80</sup> Human speech, however, can be ambiguous, imprecise, and its linguistic structure can vary, depending on such things as slang, dialect, and social context.<sup>81</sup> NLP can enable computers to derive meaning from human language in smart and useful ways.<sup>82</sup> As a result, developers can create programs to perform tasks such as automatic summarization, translation, sentiment analysis, and topic segmentation.<sup>83</sup>

"Machine learning is the science of getting computers to act without being explicitly programmed."<sup>84</sup> Its initial introduction was the result of pattern recognition and the theory that computers could learn from data without having been programmed ahead of time to perform specific tasks.<sup>85</sup> Machine learning has gotten to the point now where it enables computer systems to also improve their performance by exposure to data without the need to follow explicitly programmed instructions.<sup>86</sup> At its core, machine learning is the process of automatically discovering patterns in data.<sup>87</sup> Once discovered, the patterns can be used to make predictions and then act on them.<sup>88</sup> Although machine learning algorithms have been around for quite some time, "the ability to automatically apply complex mathematical calculations to big data—over and over, faster and faster—is a recent development."<sup>89</sup> The more transaction of data processed, the better the predictions should become.<sup>90</sup> Yet, in order for machine learning to be fully effective, it requires access to large amounts of diverse data, optimized data plat-

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<sup>77</sup> *Id.*

<sup>78</sup> *Natural language processing (NLP)*, TECHTARGET, <http://searchcontentmanagement.techtarget.com/definition/natural-language-processing-NLP>.

<sup>79</sup> *Id.*

<sup>80</sup> *Id.*

<sup>81</sup> *Id.*

<sup>82</sup> *Introduction to Natural Language Processing (NLP) 2016*, ALGORITHMIA (Aug. 11, 2016), <http://blog.algorithmia.com/introduction-natural-language-processing-nlp/>.

<sup>83</sup> *Id.*

<sup>84</sup> Stanford University, *Machine Learning*, COURSERA, <https://www.coursera.org/learn/-machine-learning>.

<sup>85</sup> *Machine Learning – What it is and why it matters*, SAS, [https://www.sas.com/en\\_us/-insights/analytics/machine-learning.html#](https://www.sas.com/en_us/-insights/analytics/machine-learning.html#).

<sup>86</sup> Schatsky, *supra* note 73.

<sup>87</sup> *Id.*

<sup>88</sup> *Id.*

<sup>89</sup> *Machine Learning*, *supra* note 85.

<sup>90</sup> Schatsky, *supra* note 73.

forms, powerful data analysis tools, and a highly scalable and flexible computer and storage infrastructure.<sup>91</sup>

Automation is oftentimes viewed as machines taking over boring and repetitive tasks.<sup>92</sup> However, in January of 2017, the McKinsey Global Institute released a two-year study, which found that we are living in a new automation age.<sup>93</sup> Robots and computers have moved past being able to only perform routine physical activities and are increasingly capable of accomplishing activities that include cognitive abilities.<sup>94</sup> A 2016 White House report attributed this rise in automation to three mutually reinforcing factors: availability of big data, improved machine learning approaches and algorithms, and more powerful computers.<sup>95</sup> The McKinsey report stated that while only a small percentage of occupations can be fully automated with current technology, some work activities of almost all occupations could be automated.<sup>96</sup> This report finds that there are five factors affecting the pace and extent of the adoption of automation—technical feasibility, cost of developing and deploying solutions, labor market dynamics, economic benefits, and regulatory and social acceptance.<sup>97</sup>

#### *D. Definition of Artificial Intelligence in the Practice of Law*

With an understanding of these foundational principles, this Comment proposes the following definition for AI in the practice of law: the theory and development of processes performed by software instead of a legal practitioner, whose outcome is the same as if a legal practitioner had done the work. This broad definition combines the use of technology with the desired end result. It follows then that various technological uses in the practice of law fall under this umbrella. This is beneficial because of the frequency and various ways with which the term AI is already used. This definition thus provides the basis of what AI does (software that performs processes which a lawyer would otherwise have done) with what it produces (the end product of a lawyer's work). Furthermore, this working definition is open-ended and allows for the formation of two subcategories, with technology falling either under the process performed

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<sup>91</sup> *Accelerate Intelligent Solutions with a Machine Learning Platform*, INTEL (2016), <http://www.intel.com/content/www/us/en/high-performance-computing/accelerate-intelligent-solutions-with-machine-learning-platform-brief.html>.

<sup>92</sup> *From Man to Machine*, COMPUTER SCIENCE ONLINE, (2017), <http://www.computerscience-online.org/cutting-edge/automation-ai/>.

<sup>93</sup> James Manyika et al., *A Future That Works: Automation, Employment, and Productivity*, MCKINSEY GLOBAL INSTITUTE, (Jan. 2017), <http://www.mckinsey.com/global-themes/digital-disruption/harnessing-automation-for-a-future-that-works>.

<sup>94</sup> *Id.*

<sup>95</sup> EXECUTIVE OFFICE OF THE PRESIDENT, WASH. D.C. 20502, ARTIFICIAL INTELLIGENCE, AUTOMATION, AND THE ECONOMY (2016), <https://obamawhitehouse.archives.gov/sites/whitehouse.gov/files/documents/Artificial-Intelligence-Automation-Economy.PDF>.

<sup>96</sup> Manyika et al., *supra* note 93, at 5.

<sup>97</sup> *Id.*

by the software (such as automation or machine learning) or under the end result (such as a legal document or legal advice).

### III. SURVEY OF CURRENT PRODUCTS AND DEVELOPMENTS OF ARTIFICIAL INTELLIGENCE

The current products and developments of AI can be viewed under the two subcategories of this definition. Difficulty in strictly categorizing under either of these two parts is expected, as there is a correlation between the two, with one depending on the other for its success. These are fact-sensitive determinations whose results will vary and depend on the process being performed and on the outcome desired. A helpful way to determine this is to ask what the main thrust of the AI is: does it focus more on the process of the software or on the end result?

#### *A. Processes Performed by Artificial Intelligence*

Legal processes have been impacted the most by AI.<sup>98</sup> This is especially true for routine legal tasks, due to the nature of their work. Routine tasks tend to be formulaic in nature and can be viewed through algorithms. Algorithms in software excel at rule-based problems.<sup>99</sup> Thus, because algorithms are in their prime when executing rule-based calculations, it follows that applying this type of software to formulaic problems will result in a higher probability of success.

##### *1. e-Discovery and Predictive Coding*

Within the process aspect, AI is most advanced in discovery, specifically e-discovery.<sup>100</sup> Legal discovery is accomplished by applying general methods of research to the review of legal documents.<sup>101</sup> E-discovery is “the process of identifying, preserving, collecting, preparing, reviewing, and producing electronically stored information.”<sup>102</sup> In practice, it is the process by which computers search a database for keywords that lawyers have determined are relevant.<sup>103</sup> The proliferation of e-discovery is due to the majority of information today being electronic,<sup>104</sup> whether it is a corporation’s cloud-based data, employees’ emails, a business’s own internal programs, personal laptops, smartphones, tablets, etc.

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<sup>98</sup> McGinnis & Pearce, *supra* note 42, at 3047.

<sup>99</sup> *Id.* at 3045.

<sup>100</sup> *Id.* at 3047.

<sup>101</sup> *Id.*

<sup>102</sup> SEDONA CONFERENCE WORKING GROUP SERIES, THE SEDONA CONFERENCE GLOSSARY: E-DISCOVERY & DIGITAL INFORMATION MANAGEMENT 18 (Sherry B. Harris ed., 3d ed. 2010).

<sup>103</sup> McGinnis & Pearce, *supra* note 42, at 3047.

<sup>104</sup> *Id.*

Prior to the advance of electronically stored information, teams of young associates performed document review.<sup>105</sup> This was an expensive and tedious task, especially as electronically stored information continued to be more prevalent.<sup>106</sup> Now, predictive coding is beginning to replace much of this work that was previously done by many associates.<sup>107</sup> Predictive coding,<sup>108</sup> also referred to as “technology aided review” (TAR), aims to replace associate input with software processes.<sup>109</sup> In broad terms, it does this through using natural language<sup>110</sup> and machine learning<sup>111</sup> techniques against gigantic sets of e-discovery.<sup>112</sup> Somewhat more specifically, predictive coding applies sets of supervised learning algorithms to classify each new record of text relative to the “gold standard data” that has been preset by an expert review.<sup>113</sup> An important recognition in viewing TAR is the relationship that occurs between the technology and the lawyer. Both need to assist each other. The lawyer assists the technology in defining this gold standard and the technology assists the lawyer in acquiring relevant data.<sup>114</sup> When this relationship is carried out correctly, it is powerful and reliable.<sup>115</sup>

Although there are varying methods to accomplish this<sup>116</sup> and it is a progressing technology, the application of AI in the legal field has been the most successful in TAR.<sup>117</sup> What previously took junior associates a significant amount of time is now being resolved by large firms setting up e-discovery units within their firms.<sup>118</sup> Evidence shows that applying e-discovery technology re-

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<sup>105</sup> Katz, *supra* note 26, at 944.

<sup>106</sup> *Id.* at 945.

<sup>107</sup> *Id.*

<sup>108</sup> Predictive coding is performed with the help of the lawyer. The lawyer picks a subset of discovery documents and from these, categorizes those that are relevant and not relevant. The software then reviews these categorized documents and applies what it learns from them to the wider set of data. In other words, the software performs the same analysis to the wider set of data that the lawyer performed to the subset. It does this based on what the lawyer deemed as relevant and not relevant.

<sup>109</sup> McGinnis & Pearce, *supra* note 42, at 3047.

<sup>110</sup> Natural language processing occurs when a computer can understand human language. The computer can interpret what a human actually means—deciphering intent and therefore providing more accurate and relevant answers and search results. Andrew Arruda, *Artificial Intelligence Systems and the Law*, PEER TO PEER: THE QUARTERLY MAGAZINE OF ILTA, Summer 2016 at 38, 39.

<sup>111</sup> *Id.* Machine learning describes a system that can take data points, process them to improve performance at completing a task, and then loop that process to continue doing the task while continuously improving. *Id.*

<sup>112</sup> Mills, *supra* note 45.

<sup>113</sup> Katz, *supra* note 26, at 947.

<sup>114</sup> Mills, *supra* note 45. This is still a very basic explanation of the process. For a somewhat more comprehensive understanding, see Katz, *supra* note 26.

<sup>115</sup> Mills, *supra* note 45.

<sup>116</sup> Katz, *supra* note 26, at 947.

<sup>117</sup> Mills, *supra* note 45.

<sup>118</sup> McGinnis & Pearce, *supra* note 42, at 3047.

duces the time spent in discovery by seventy-five percent, with associated costs following suit in reduction.<sup>119</sup>

## 2. Legal Research

Legal research has seen the use of technology for quite some time. This is obvious in the use of WestLaw and LexisNexis by law schools across the country. This work is done through a combination of creative keyword searches and a significant amount of time. A common problem with this practice is that searches usually yield mass amounts of references that must be combed through to determine the worth and relevance to the issue at hand.

The change occurring here is the replacement of keyword searches with semantic searches.<sup>120</sup> Semantic search allows one to search by natural language queries, instead of keywords.<sup>121</sup> For example, in searching for “assumption of risk,” the search may bring up cases that do not use these words but still result in relevant material.<sup>122</sup> This is emerging technology and its use is still not seen in full force, though quite a few startups are attempting to capitalize on this.<sup>123</sup>

Currently, existing search engines work by identifying references and then evaluating their optimal use, with the lawyer issue spotting<sup>124</sup> and using the search engine’s results to finalize the relevant data.<sup>125</sup> Yet predictions are that the search engine will eventually perform issue spotting to a set of facts and then provide the relevant documents.<sup>126</sup> Another prediction is that the search engine will be able to determine the strength of precedents.<sup>127</sup> These predictions currently require improvements in search technology, with expectations that the process will be perfected within ten to fifteen years.<sup>128</sup>

Recently, Thomson Reuters announced plans to incorporate AI into its information businesses, even hinting that a Watson-esque AI service is likely to be regulated with respect to financial services in the near future.<sup>129</sup> Thomson Reuters gave itself more than a year timeline to create a beta product, showing that it “takes time, human expertise, and painstaking effort to assemble useful data

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<sup>119</sup> Pasquale & Cashwell, *supra* note 42, at 34.

<sup>120</sup> McGinnis & Pearce, *supra* note 42, at 3048.

<sup>121</sup> *Id.*

<sup>122</sup> *Id.*

<sup>123</sup> See, e.g., ROSS INTELLIGENCE, [www.rossintelligence.com](http://www.rossintelligence.com) (last visited Nov. 13, 2017); JUDICATA, [www.judicata.com](http://www.judicata.com) (last visited Nov. 13, 2017); RAVEL LAW, [www.ravellaw.com](http://www.ravellaw.com) (last visited Nov. 13, 2017).

<sup>124</sup> Issue spotting is a common legal skill in which one reads a fact statement to determine what legal issues, if any, may arise. *Issue Spotting Skills*, LAW SCHOOL SECRETSTO SUCCESS, <http://www.law-school-secretstosuccess.com/issue-spotting-skills> (last visited Nov. 13, 2017).

<sup>125</sup> McGinnis & Pearce, *supra* note 42, at 3049.

<sup>126</sup> *Id.*

<sup>127</sup> *Id.*

<sup>128</sup> *Id.*

<sup>129</sup> Mills, *supra* note 45.



sets, analyze the content, train the algorithms, and test the results. The broader the targeted topic, the greater the effort.”<sup>130</sup>

### B. Products Resulting from Artificial Intelligence

In February 2017, Seyfarth Shaw, an international AmLaw 100 law firm,<sup>131</sup> announced it will be the first major law firm to use AI to move information between computer programs.<sup>132</sup> While this is a process under our current definition, Seyfarth Shaw reported that the technology was already resulting in exponential gains in productivity and also predicted that the technology would assist in analyzing contracts and contract flow.<sup>133</sup> This type of prediction is common, with other experts predicting that the current technology will not be limited to processes, but will expand to accomplish the end results of legal work.<sup>134</sup> The existing products resulting from the implementation of AI in the legal field currently range from the more advanced document generation providers to the up-and-coming predictive analytics.

#### 1. Document Generation

Document generation is similar to the routine work mentioned in the previous section in that for certain situations, there is a predetermined legal form that needs to only be completed, or a contract that can be created by simply combining provisions of previous contracts.<sup>135</sup> Alongside generating forms, there is the potential for the generation of briefs and memos as well.<sup>136</sup>

Already, there are software programs that can generate wills,<sup>137</sup> incorporation documents,<sup>138</sup> real estate documents,<sup>139</sup> loan agreements,<sup>140</sup> promissory

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<sup>130</sup> *Id.*

<sup>131</sup> *Seyfarth Shaw Law Firm Profile*, THE AM. LAWYER, <http://www.americanlawyer.com/law-firm-profiles-result?firmname=Seyfarth+Shaw&slreturn=20170122164446> (last visited Feb. 22, 2017).

<sup>132</sup> Debra Cassens Weiss, *Seyfarth Signs Licensing Deal with ‘Software Robots’ Company to Automate Mundane Tasks*, ABA JOURNAL (Feb. 8, 2017, 9:40 AM), [http://www.abajournal.com/news/article/seyfarth\\_signs\\_licensing\\_deal\\_with\\_software\\_robots\\_company\\_to\\_automate\\_mund/?utm\\_source=maestro&utm\\_medium=email&utm\\_campaign=weekly\\_email](http://www.abajournal.com/news/article/seyfarth_signs_licensing_deal_with_software_robots_company_to_automate_mund/?utm_source=maestro&utm_medium=email&utm_campaign=weekly_email). Seyfarth Shaw saw results in speeding up the client’s onboarding process from thirty-five minutes to four minutes. *Id.*

<sup>133</sup> *Id.*

<sup>134</sup> Another example is ROSS Intelligence, predicting that their software will be able to analyze legal documents, debate various sides of an issue, review contracts, and draft legal documents. Arruda, *supra* note 110.

<sup>135</sup> See Ephraim Nissan, *Digital Technologies and Artificial Intelligence’s Present and Foreseeable Impact on Lawyering, Judging, Policing and Law Enforcement*, 32 AI & SOC’Y, 441, 445 (2015).

<sup>136</sup> McGinnis & Pearce, *supra* note 42, at 3050.

<sup>137</sup> See, e.g., ROCKETLAWYER, [www.rocketlawyer.com](http://www.rocketlawyer.com) (last visited Nov. 13, 2017); LEGALZOOM, [www.legalzoom.com](http://www.legalzoom.com) (last visited Nov. 13, 2017); EZEWEILL, [www.ezeewill.com](http://www.ezeewill.com) (last visited Nov. 13, 2017).

notes,<sup>141</sup> and contracts.<sup>142</sup> All are accomplished via similar processes—an individual submits information into the system, which then generates the document. The generation of legal documents raises issues of potential liability for the company that generated them.<sup>143</sup> Also, at the beginning, lawyers will continue to be involved in the evaluation of these documents to determine their viability.<sup>144</sup> Yet the financial savings and reduction in time spent, for firms and clients, has already been seen.<sup>145</sup> The goal here is to have software that can not only automate a form, but also tailor it to the individual facts and arguments of a particular situation and even track its effect in future litigation.<sup>146</sup> It is predicted that within ten to fifteen years, software will routinely generate the first draft of most transactional documents.<sup>147</sup>

This generation of transactional documents also leads to the idea of software's ability to write motions, complaints, and other legal memos and briefs. Under the current understanding of technology, this will be more difficult to accomplish because of the generally non-routine and non-formulaic nature of the work. Yet in analyzing the formation of a complaint, for example, there is an inherent systematic process that is used. This process would vary, of course, with the facts of the case and the legal argument that follow. As a result, computer-generated drafts could prove to be valuable and comparable to the efforts of associates who generate drafts that an experienced legal practitioner can then edit and refine for a valid final product.<sup>148</sup>

However, no software can currently produce these results. There is also skepticism that computer programs will ever create productive logical arguments. An example of this is analogical reasoning, which is a technique taught in law schools and used throughout the legal profession. It is central to the purposes of legal research, applying precedent, and arguing a case. Yet “we are still

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<sup>138</sup> FENWICK & WEST, [www.Fenwick.com](http://www.Fenwick.com) (last visited Nov. 13, 2017).

<sup>139</sup> HOTDOCS, [www.hotdocs.com](http://www.hotdocs.com) (last visited Nov. 13, 2017).

<sup>140</sup> See LAWDEPOT, [www.lawdepot.com](http://www.lawdepot.com) (last visited Nov. 13, 2017).

<sup>141</sup> See *id.*

<sup>142</sup> See EBREVIA, [www.ebrevia.com](http://www.ebrevia.com) (last visited Nov. 13, 2017).

<sup>143</sup> This is an entirely separate, but very important issue. Many articles have recently been written about the legal liability of AI. For a current argument in how this should be regulated, see Matthew U. Scherer, *Regulating Artificial Intelligence Systems: Risks, Challenges, Competencies, and Strategies*, 29 HARV. LAW & TEC. 353 (2016). For an argument of the four possible scenarios resulting from a combination of the high & low probabilities of automation with the high and low intensity of legal regulation, see Frank Pasquale & Glyn Cashwell, *Four Futures of Legal Automation*, 63 UCLA L. REV. DISC. 26 (2015).

<sup>144</sup> McGinnis & Pearce, *supra* note 42, at 3050.

<sup>145</sup> *Id.* “It reduced the average time we were spending from about 20 to 40 hours of billable time down to a handful of hours . . . . In cases with even extensive documents, we can cut the time of document creation from days and weeks to hours.” *Id.* at 3051.

<sup>146</sup> *Id.*

<sup>147</sup> *Id.*

<sup>148</sup> *Id.*

far away from a machine that can engage in ‘hard’ analogical reasoning.”<sup>149</sup> This is not to say, however, that it is impossible.<sup>150</sup> Furthermore, it is proposed that as software that generates legal forms becomes more effective and efficient, future technology will focus more on the generation of legal arguments in briefs and memos.

## 2. Predictive Analytics

As the term suggests, predictive analytics makes predictions after analyzing data. The ease in organizing big data now allows for the creation of software that can read these data, find patterns, analyze regularities within the patterns, and then make predictions for future situations.<sup>151</sup> This is not new technology, and is already implemented in banking,<sup>152</sup> venture capital, and even in bail sentencing and parole decisions.<sup>153</sup> The ability to properly apply predictive analytic software to the legal field is apparent considering the practice of law is based on massive amounts of data from constitutions, statutes, case law, secondary sources, briefs, and other documents.<sup>154</sup> The predictive actions of software would mirror the predictive actions of a lawyer as they inform their client of the possibility of success, failure, and what the best step would be to move forward.

A current application of this is in the intellectual property (IP) field, specifically in predicting patent disputes. Lex Machina,<sup>155</sup> having organized a high-volume of IP case data, uses data mining and predictive analytics techniques to predict IP litigation outcomes.<sup>156</sup> Recently, Lex Machina has begun to include court dockets, resulting in new forms of insight and prediction.<sup>157</sup> Motion Kick-starter, another example of such work, “enables attorneys [to] view granted motions with denied motions to see what’s working and what’s not. Enter a judge’s name and motion type and instantly view the judge’s recent orders on that motion type, as well as the briefing that led up to those orders.”<sup>158</sup>

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<sup>149</sup> Katz, *supra* note 26, at 955.

<sup>150</sup> *Id.*

<sup>151</sup> *Id.*

<sup>152</sup> See Nikos Acuña, *The Predictive Bank of the Future*, THE FINANCIAL BRAND (Oct. 28, 2016), <https://thefinancialbrand.com/61961/predictive-analytics-banking/>.

<sup>153</sup> See Jason Tashea, *Risk-assessment algorithms challenged in bail, sentencing and parole decisions*, ABA JOURNAL (Mar. 1, 2017, 1:30 AM), [http://www.abajournal.com/magazine/article/-algorithm\\_bail\\_sentencing\\_parole/?utm\\_source=maestro&utm\\_medium=email&utm\\_campaign=weekly\\_email](http://www.abajournal.com/magazine/article/-algorithm_bail_sentencing_parole/?utm_source=maestro&utm_medium=email&utm_campaign=weekly_email).

<sup>154</sup> McGinnis & Pearce, *supra* note 42, at 3052.

<sup>155</sup> Lex Machina is a company that provides legal analytics of litigation data to companies and law firms. *What We Do*, LEX MACHINA, <https://lexmachina.com/what-we-do/> (last visited Nov. 1, 2017).

<sup>156</sup> Mills, *supra* note 45.

<sup>157</sup> *Id.*

<sup>158</sup> *Id.*

Startups are taking advantage of predictive analytics and applying this to new avenues. Justice Toolbox, a fairly new startup, collects millions of official court records, analyzes the court records using AI, and publishes lawyers' statistics.<sup>159</sup> The statistics show how often the lawyer has won similar cases, how many similar cases the lawyer handled recently, and view other metrics like settlement rates.<sup>160</sup> The search can be done through the lawyer's name, case type, or location.<sup>161</sup> Currently, Justice Toolbox offers statistics for only Washington D.C. and Maryland lawyers and is free for public use.<sup>162</sup>

A similar application of predictive analytics is being used to assess the future success of lawyers not by a potential client, but by the law firm and other legal enterprises themselves.<sup>163</sup> LawyerMetrix provides data analytics products in five main areas, one of them being human capital management.<sup>164</sup> LawyerMetrix defines this as "a set of evidence-based systems to select, recruit, develop, retain, and promote top talent," recognizing that the best competitive advantage is a group of better lawyers working together as a team.<sup>165</sup> LawyerMetrix determines what this top talent is by analyzing various factors such as grades, rank, clerkship, work experience, advanced degrees, publications, and even participation in team sports.<sup>166</sup>

In 2002, a group of political scientists and law professors created the Supreme Court Forecasting Project and obtained predictions for every argued case in the 2002 term prior to oral argument using statistical models and predictions of expert legal analysts.<sup>167</sup> The legal experts correctly predicted the outcomes 59.1% of the time, while the statistical model correctly predicted the outcomes 75% of the time.<sup>168</sup> Although this was not done by the use of AI, it is significant because it shows the potential of predictive analytics. It is an argument for the effectiveness and versatility of data-driven analytics.

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<sup>159</sup> *Everyday Justice*, JUSTICE TOOLBOX, <https://www.justicetoolbox.com> (last visited Feb. 11, 2018).

<sup>160</sup> *Id.*

<sup>161</sup> Debra Cassens Weiss, *Startup helps consumers evaluate lawyers by compiling win records*, ABA JOURNAL (Feb. 10, 2017, 12:59 PM), [http://www.abajournal.com/news/article/startup\\_helps\\_consumers\\_evaluate\\_lawyers\\_by\\_compiling\\_their\\_win\\_records/?utm\\_source=maestro&utm\\_medium=email&utm\\_campaign=weekly\\_email](http://www.abajournal.com/news/article/startup_helps_consumers_evaluate_lawyers_by_compiling_their_win_records/?utm_source=maestro&utm_medium=email&utm_campaign=weekly_email).

<sup>162</sup> *Id.*

<sup>163</sup> Katz, *supra* note 26, at 934.

<sup>164</sup> *About us*, LAWYERMETRIX, <https://www.lawyermetrix.net/about-us> (Last visited Jan. 31, 2018).

<sup>165</sup> *What We Do*, LAWYERMETRIX, <https://www.lawyermetrix.net/about-us> (last visited Feb. 11, 2018).

<sup>166</sup> Katz, *supra* note 26, at 935.

<sup>167</sup> Theodore W. Ruger et al., *Essay, The Supreme Court Forecasting Project: Legal and Political Science Approaches to Predicting Supreme Court Decisionmaking*, 104 COLUM. L. REV. 1150, 1150 (2004).

<sup>168</sup> *Id.*

Following this success, LexPredict has not only built models to predict the outcome of Supreme Court cases,<sup>169</sup> but is assisting law firms, corporate counsel, and the public sector by providing off-the-shelf software for predictive modeling.<sup>170</sup> This software incorporates machine learning to address legal issues, such as an early case assessment for an Equal Employment Opportunity Commission matter.<sup>171</sup> It allows the user to input facts, documents, cost-effective figures, answers to customized survey questions, and other variables into the program to determine the probable outcomes of various legal options.<sup>172</sup>

### 3. Contract Analysis

Contract analysis involves determining the relationship between contracts through identifying similarities and differences between various agreements.<sup>173</sup> Such analysis can significantly reduce contract drafting and contract management costs.<sup>174</sup> An example of this is Kira Systems.<sup>175</sup> Kira consists of a user interface that allows one to import documents that Kira then converts into machine-readable forms and uses machine learning models to identify the concepts and clauses the user specifies.<sup>176</sup> Kira's search and analysis tools spot legal issues and trends across documents (such as change of control, governing law, indemnity, and limitations of liability) and create summary charts and reports that can be exported and used by others.<sup>177</sup> Furthermore, Kira allows for comparison of contracts to other forms that allows a user to see where changes have been made across an entire pool of agreements.<sup>178</sup>

Brightleaf is a company that utilizes software to automate the entire process of abstracting information from all of a user's contracts.<sup>179</sup> Brightleaf utilizes a semantic intelligence engine to process the contracts and creates an index of all

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<sup>169</sup> Mills, *supra* note 45.

<sup>170</sup> LEXPREDICT, <https://lexpredict.com> (last visited Feb. 11, 2018).

<sup>171</sup> *Lex-Explainer Video: Intelligent Crowd-Sourcing For Legal*, LEXPREDICT, <https://lexpredict.com/portfolio/lexsemble-explainer-video-intelligent-crowd-sourcing-legal/> (last visited Feb. 22, 2017). The software asks questions such as: What are our chances of winning at trial? Does the plaintiff have a valid claim? How much will the plaintiff settle for? Should we settle or litigate? *Id.*

<sup>172</sup> *Id.*

<sup>173</sup> Kingsley Martin, *Comparative Analysis, A study of Employment, Contractor, and Severance Agreements*, CONTRACT ANALYSIS AND CONTRACT STANDARDS (Mar. 1, 2012, 7:19 AM), <http://contractanalysis.blogspot.com/2012/03/comparative-analysis.html>.

<sup>174</sup> *Id.*

<sup>175</sup> *How Kira Works*, KIRA, <https://www.kirasystems.com/how-it-works> (last visited Feb. 11, 2018).

<sup>176</sup> *Id.*

<sup>177</sup> *Id.*

<sup>178</sup> *Kira for Contract Analysis*, KIRA, <https://www.kirasystems.com/how-it-works/contract-analysis> (last visited Feb. 22, 2017).

<sup>179</sup> *Automated Contract Abstraction*, BRIGHTLEAF, <http://www.brightleaf.com/automated-contract-abstraction/> (last visited Feb. 11, 2018).

the key terms, provisions, and obligations.<sup>180</sup> Legal Robot uses machine learning techniques to understand legal language, compare it to other contracts to identify boilerplate and custom provisions, measures the complexity and readability of the language, and identifies the responsibilities, rights, and terms of an agreement.<sup>181</sup> As a result, Legal Robot considers best practices, risk factors, and jurisdictional differences to flag legal issues and suggest improvements.<sup>182</sup> Legal Robot's aim is not only to automate legal processes, but to help individuals understand legal language without consulting a lawyer.<sup>183</sup>

A final example is LawGeex, a company that is utilizing AI to automate contract review.<sup>184</sup> Among LawGeex's various features, LawGeex can read, review, and understand contracts to approve those that satisfy pre-determined criteria.<sup>185</sup> LawGeex can also pinpoint discrepancies, recognize if certain clauses are rare, missing, or potentially problematic, and create a report with all of this information.<sup>186</sup> Furthermore, LawGeex allows users to create their own legal playbook, define clauses as mandatory or unacceptable and have the software enforce the rules for every future contract submitted to the program.<sup>187</sup>

#### IV. IMPLICATIONS IN FOUR ASPECTS OF LEGAL

As can be seen from the current state of AI in the legal field, the hype surrounding the development of AI can at times be overly simplistic or exaggerated in nature. The predictions of the future impact of AI are just that, predictions. Furthermore, changes in aspects such as technology, regulation, client expectations, and legal practitioner use will also alter the course of AI implementation. In light of this, this Comment views the potential impact of AI through four aspects of the practice of law: process work and research, legal analysis, interaction with clients, and oral advocacy.

##### A. Process Work and Research

As mentioned in Part III, AI implementation has impacted legal process work the most.<sup>188</sup> AI has been utilized to accelerate discovery and reduce costs

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<sup>180</sup> *Id.*

<sup>181</sup> LEGAL ROBOT, <https://www.legalrobot.com> (last visited Feb. 11, 2018).

<sup>182</sup> *Id.*

<sup>183</sup> *Id.*

<sup>184</sup> *Features that Help You Get Sh\*t Done*, LAWGEEX, <https://www.lawgeex.com/features/#ai> (last visited Feb. 11, 2018).

<sup>185</sup> *Id.*

<sup>186</sup> *Interactive Contract Reports*, LAWGEEX, <https://www.lawgeex.com/features/#ai> (last visited Feb. 22, 2017).

<sup>187</sup> *Your Legal Playbook, Automated*, LAWGEEX, <https://www.lawgeex.com/features/#ai> (last visited Feb. 22, 2017).

<sup>188</sup> See discussion *supra* Part III.

associated with e-discovery.<sup>189</sup> Although AI is not perfect in executing e-discovery, the same is true for virtually any lawyer.<sup>190</sup> Where any legal practitioner is prone to fatigue, boredom, fraud, inexperience, and other shortcomings, AI will be immune to these human frailties,<sup>191</sup> subject to its user. Some courts have already approved predictive coding for discovery because they believe the price and performance is at least equal to traditional methods.<sup>192</sup> Although legal research is behind the curve in seeing solid results like those in discovery, AI is capable of clustering documents, segregating them based on inputted rules, and producing smart results beyond just basic keyword searches.<sup>193</sup>

Given the prevalence with which e-discovery has already gained ground, and seeing more courts approve and prefer TAR,<sup>194</sup> it is not unreasonable to state that this will become the norm. As more practitioners use AI, its cost-saving and quality-results benefits will convince more to follow suit.<sup>195</sup> Legal research seems to be the next avenue to pursue in applying AI, and it is proposed that as e-discovery sees progress and implementation, practitioners will seek further use of AI with legal research next.

Yet, in seeing these changes already and predicting future ones, this is not a radical change in the legal field.<sup>196</sup> Rather, it is just a function of a change in the market for legal services.<sup>197</sup> The fact that AI is a cheaper and more efficient alternative in practice is not revolutionizing the industry.<sup>198</sup> Rather, it is an occurrence which has been seen many times over—an implementation of new tools to do things better.<sup>199</sup> In reviewing the AI products that we have, we see that it is really just smart e-discovery and smart case search.<sup>200</sup> This suggests that Moore's Law, which states that technological speeds have been doubling every 18 months, may really only apply to applications that automate simple legal work, not highly advanced applications programmed to perform complex tasks.<sup>201</sup>

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<sup>189</sup> See discussion *supra* Part III.

<sup>190</sup> McGinnis & Pearce, *supra* note 42, at 3047.

<sup>191</sup> *Id.*

<sup>192</sup> *Id.* citing Moore v. Publicist Groupe, 287 F.R.D. 182, 193 (S.D.N.Y. 2012).

<sup>193</sup> *Id.*

<sup>194</sup> Hyles v. New York City, No. 10CIV3119ATAJP, 2016 WL 4077114 (S.D.N.Y. Aug. 1, 2016); See also *In re Viagra (Sildenafil Citrate) Products Liab. Litig.*, No. 16-MD-02691-RS (SK), 2016 WL 7336411 (N.D. Cal. Oct. 14, 2016).

<sup>195</sup> *Id.*

<sup>196</sup> See Thomson Reuters, *Video: Will Artificial Intelligence Have a Radical Impact on the Legal Profession*, LEGAL EXECUTIVE INSTITUTE (Aug. 1, 2016), <http://legalexecutiveinstitute.com/-video-will-ai-impact-legal-profession/>.

<sup>197</sup> *Id.*

<sup>198</sup> *Id.*

<sup>199</sup> *Id.*

<sup>200</sup> *Id.*

<sup>201</sup> *Id.*

As a result, AI is not likely to replace lawyers in procedural aspects of legal practice or in legal research. Instead, AI will be used to complete remedial tasks via automation—allowing lawyers to focus on the more detailed and high-level work of analysis.

### *B. Legal Analysis*

The rise of the information world has bombarded individuals with vast amounts of data. Many laypeople can search for what the law is, how it has been applied, and deduce on their own what options they may have. Entrepreneurs are attempting to develop software that will take a query in natural language form and give a valid legal solution.<sup>202</sup> Also, as explained above, there is AI that accomplishes analysis of contracts and provides certain information to the user, and AI that can predict the outcome of certain cases or a cost-benefit analysis of settling or going to trial.<sup>203</sup>

Yet, it is argued here that a lawyer will always be needed. This necessity begins first with the technology. No AI currently allows for this ideal futuristic machine that can answer any legal question directly and accurately. Legal practitioners will be needed to guide the formation of such AI. Thus, we will need legal experts who can work with computer scientists to develop such AI.

Even if such technology is developed, which could replace the analytical process of lawyers, who will be there to determine its accuracy? IBM's Watson, who won Jeopardy in 2011,<sup>204</sup> still gave three to four possible answers with its probability of accuracy and sometimes only used the most plausible correct answer after meeting a certain threshold—and it was still wrong at times.<sup>205</sup> Lawyers will be needed to determine the accuracy of the answers that AI will provide, and to determine whether it is still a valid answer or decision.<sup>206</sup> They will be needed to oversee and correct any future errors of AI.

As an application of this necessity, if AI were to replace incoming associates at any point in time, eventually all of the existing lawyers at that time would retire and there would be no one to replace them.<sup>207</sup> This is highly improbable for a variety of reasons. For example, no one would be left to determine whether the AI was correct; no one would be left to disagree or argue otherwise. To think of a society that relies solely on software to evaluate the legality of any and all actions seems unreasonable and unrealistic.

To argue otherwise would require the implementation of a single AI software that is consistent in the answers that it gives to all. Even if this were not the

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<sup>202</sup> See discussion *supra* Part III.

<sup>203</sup> See discussion *supra* Part III.

<sup>204</sup> John Watson, *Computer Wins on 'Jeopardy!': Trivial, It's Not*, NY TIMES (Feb. 16, 2011), [http://www.nytimes.com/2011/02/17/science/17jeopardy-watson.html?pagewanted=all&\\_r=0](http://www.nytimes.com/2011/02/17/science/17jeopardy-watson.html?pagewanted=all&_r=0).

<sup>205</sup> *Id.*

<sup>206</sup> *Id.*

<sup>207</sup> Thomson Reuters, *supra* note 196.



case, two opposing parties disputing, for example, a case, or a contract, with their own AI, would each argue that their AI is better, more accurate. How would this be resolved? The notion of AI providing one correct answer to a legal question is misleading because, as any practicing lawyer knows, there is almost never only one right answer to a legal question. Whether it is transactional or litigation work, one pleads alternative causes of actions, attempts to arbitrate, settle, plead for the mercy of the court, or asks for the opposing party to compromise.

In a discussion panel, Andrew Bodnar brought up a significant point: he stated that a computer could analyze facts along with a data bank of precedents, and it could correlate the two, but he questioned whether the computer could ever reach a state where it could go beyond understanding what the law is to also understanding the reasons the law is what it is.<sup>208</sup> Supreme Court cases are often based on policy, and overturned on such.<sup>209</sup> How would AI deal with this overturning of legal precedent that is based on policy? Could a computer understand the policy reasons behind statutes and case law, and use this factor in its analysis to arrive at a correct conclusion? How would a computer be programmed to determine what a reasonable person would do to choose between the charges of second-degree murder or voluntary manslaughter? How could a computer arrive at a correct conclusion for the highly fact-sensitive landmines of trust and estate cases that often appear to be based on an outcome-oriented analysis? The ability of a board of directors to fire a CEO would well be within their legal options, but how could a computer correctly analyze the effects that this decision would have on the morale of the startup, its employees, other executive officers, and board members? Just because one has a legal right to do something does not mean it should be done.

Legal analysis also requires the creation of complaints, briefs, memorandums, and other documents. No software can currently create a rough draft of any of these documents. While AI can determine whether the document exceeds the page limit the court imposes or combine contract provisions, it cannot write a logical legal argument that puts forth the facts of the case, causes of action, arguments, and why the desired remedies are appropriate. AI cannot analyze precedent, apply it to a set of facts, and conduct analogical reasoning. Legal writing also requires creativity and the ability to argue in a concise, direct way while applying the law to the facts. None of which is possible by AI.

The direction of this section leads to the notion that legal analysis goes beyond only applying statutes or case law. Legal analysis requires an understanding of existing policy, the recognition of how a policy argument can win a case, awareness of the real-life implications of a decision, and insight into the con-

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<sup>208</sup> *Id.*

<sup>209</sup> *Id.*

stantly changing landscape of politics. In short, it requires cognizance of human factors that cannot be measured, formulated, or reduced to an algorithm.

### *C. Interaction with Clients*

The example of advising a board to not fire a CEO due to the negative consequences it would have on the business, highlights various aspects of a lawyer's work that cannot be replaced by AI. A well-seasoned lawyer is not just good at the law, they know how to speak to opposing counsel, how to compromise, and they understand the various needs of the client. Many decisions involve the interaction of various factors that cannot be measured or written in code. How many divorce disputes could be settled with sincere apologies instead of calculated options based on securing the highest amount of assets? Bodnar stated that very often clients approach lawyers and say that they have a problem; what a lawyer needs to do is help them get to the heart of issue, they need to understand what it is that the client is actually concerned about and what they really would like to achieve.<sup>210</sup>

The human nature of a client will always exist, and AI cannot fully replicate how a lawyer responds to the human nature aspect. A lawyer needs to understand the facets of human relationships in broad terms; lawyers need to understand what is currently occurring in the world, in the country, and in their communities. Issues such as politics, public relations, and how one is perceived by society are all factors that a good lawyer evaluates when advising a client, not just whether the proposed court of action is legal.

### *D. Oral Advocacy*

Much the same as the inability of AI to be as effective as a lawyer in advising clients, oral advocacy is an art that cannot be replicated by software. It is argued here that in order to be effective, AI would need to replicate human awareness. It would have to look at the faces of the jury members, determine the temperament of the judge, and acknowledge the mood of the witness before being able to proceed with calculated words and tone. Trial advocacy courses teach much more beyond what is legal and illegal. Appellate arguments go back and forth between judges and counsel. Oral advocacy requires not only the ability to precisely convey an argument but also convince others of its merits because it is the right thing to do.

To argue that AI will completely replace lawyers is to state that judges and juries would only read a transcript provided by AI. What of the trial itself, the arguments, direct and cross examinations, and witnesses that make up the trial procedure? Who would object to relevancy questions? And how would the ob-

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<sup>210</sup> *Id.*

jection be resolved? Who would replace judges on the bench throughout the country? To propose that AI would accomplish all this may perhaps be plausible given  $x$  amount of time, but the ability to do so would be outweighed by those factors our society deems more valuable than efficiency and accuracy—human emotion, fairness, empathy, and justice.

#### V. CONCLUSION

Artificial intelligence has made its debut in the legal field. It is beginning to automate tasks previously executed only by those skilled in the law. It has impacted the field of discovery, legal research, the generation of legal documents, and predictive analytics. It is also attempting to automate various other tasks, perform legal analysis, and assist in compliance. Yet, despite its success, it will not replace lawyers. Though it may automate routine legal tasks, it will still require a lawyer's oversight when performing research. It will assist in compiling data for analysis, but a lawyer will always be necessary for the analysis of the facts, the law, and the creation of legal memorandum. Furthermore, certain clients will always need a human aspect in their consultation. The human relationship, as used in understanding the client's needs and advocating for them, cannot be replaced by software. Neither can AI replace the oral advocacy skills of a seasoned lawyer. Finally, legal practitioners will always be needed to guide the creation of such software, correct it, and use its products to guide the client and the court to the correct and right determination. Until software can be emotionally intelligent, cognizant of its surrounding social circumstances, aware of the desires of the community, and utilize the policy reasons behind the law, a lawyer will always be required.